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EXAMINER	
ROBINSON, LAUREN E	

ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
07/25/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/562,121	BAUBET ET AL.	
	Examiner	Art Unit	
	LAUREN ROBINSON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *16-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-15 in the reply filed on May 27, 2008 is acknowledged. The traversal is on the ground(s) that "no adequate reasons and/or examples have been provided to support a conclusion of patentable distinctiveness between the identified groups. Also, it has not been shown that a burden exists in searching the claims of the three groups".

This is not found persuasive because patentable distinctiveness has been shown by the earlier showing of a lack of a special technical feature. Furthermore, there is a burden in the searching the claims of the three groups because each group would require searches in different class/subclasses. For example, 428/ 833.1 for the first group, 427/524 for Group 2 and 505/411 for Group 3.

For the above reasoning, the requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claim 3 are objected to because of the following informalities:

- Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim because claim 3 is dependent on claim 2 wherein according to the applicants' disclosure; the "very low roughness" limitation of claim 2 is defined as being the same limitation claimed in claim 3. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 1 is rejected as being indefinite because of the broad limitations followed by narrow limitations. The broader limitation substrate and the narrower limitation glass substrate are both recited. Likewise the broad limitation sputtering and the narrower limitations magnetically enhanced sputtering or reactive sputtering are recited. The metes and bounds of applicants' claims are thus unclear.

For applying prior art, it is the examiner's position from the applicants' disclosure that the substrate is glass and the sputtering method is magnetically and/or reactive and is a different source than the ion beam exposure source therefore, ion beam sputtering is not used.

- Claims 2-15 are rejected as being dependent on claim 1 which was rejected for the above reasons.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anzaki et al. (US Pub. No. 2002/0086164) in view of Wasa et al. ("Handbook of Sputter Deposition Technology: Principles, Technology and Applications" published 1992 in further view of Fenner (US Pub. 2002/0139772).

Regarding claim 1: The examiner notes that claim 1 is a product by process claim due to the claim disclosing the manner in which the layer is deposited by sputtering with exposure to at least an ion beam from an ion beam source and wherein the layer exposed is crystallized. According to the MPEP, product by process claims might be limited by and defined by the process but the determination of patentability is based on the product itself and not on its method of production. Therefore, if the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product might have been made by a different process.

In the instant case, Anzaki et al. teach a light transmitting electromagnetic wave filter comprising a substrate and at least one dielectric film layer (abstract). The reference teaches that the layer can be deposited with a thickness of 40nm (0078). Due to the applicants' illustrating in their disclosure that thin-film dielectrics can be dielectric layers with that are deposited with a thickness of 40nm which is disclosed in paragraph 0091 of the applicants' publication, it is the examiner's position that the layers correspond to the applicants' thin-film layers.

Also, the reference teaches that the substrate may be glass (0003) and that the layers may be deposited onto the substrate by means of sputtering (0047-0048) which may be reactive sputtering in the presence of oxygen and/or nitrogen (0017,0084) or magnetically enhanced sputtering (0088,0102). However, the reference is *silent regarding the layers being crystallized and the layer being sputtered in the presence of an ion beam from an ion source.*

While Anzaki et al. does not specifically disclose the above limitations, the reference teaches that there is a need for high visible transparency through the filter (0095) while reflecting infrared radiation (0041-0042) and that the overall filter is comprised of alternating layers of silver and the dielectric which is zinc oxide (0031, 0047). Also, they teach that the coated substrate is heated during magnetic sputtering at a temperature of 200°C (0093, 0102).

<u>Consider the layer being crystallized</u>

Although Anzaki et al. does not specifically disclose that the layer exposed to the ion beam source is crystallized; the examiner notes that it is known in the art that crystallized layers will reflect IR radiation differently than a layer which is not crystallized as the orientation of the crystals will reflect light in directions corresponding to the crystallized structure. Therefore, if one desired to reflect IR radiation in various directions rather than linearly, they would recognize that this could be done by crystallizing the layers and they would know that adjusting the crystallization of layers can be obtained by optimizing production parameters and techniques such as heat,

sputtering conditions, etc. as evidenced by Wasa et al., on page 146 of “Handbook of Sputter Deposition Technology…”.

Also, the examiner notes that while crystallization of layers is known in the art to affect the optical properties of the layers, it is also known in the art that if layers are deposited on top of each other, that the layers are better adhered to the surfaces of the layers below if the surfaces are smooth. For example, if two layers had smooth surfaces, then when laminated, their surfaces would rest flat on top of each other and therefore, leave no gaps which would thereby produce a better adhered laminate and in result, affect the physical properties of the filter such as no irregularities therein. However, as discussed that crystallization would be recognized by one of ordinary skill in the art as advantageous to adjust the optical properties, it is also known that crystallized layers will create slight roughness on the surface of layers which will affect the previously discussed adherence property.

Therefore, it is the examiner’s position that as one of ordinary skill in the art would recognize that if it would be advantageous to have both crystallization and layers with smooth surfaces, they would look to the prior art to find suitable production parameters for obtaining crystallization for the above films including zinc oxide films, which will also allow for smooth layer surfaces.

In particular, Wasa et al. teach that zinc oxide layers which are applied to substrates through magnetron sputtering wherein the substrates are heated to 200 degrees Celsius, can have both smoothness and crystallization by adjusting the magnetron parameters (Pg. 146).

As both Anzaki et al. and Wasa et al. disclose magnetron sputtering techniques for applying zinc oxide films on a substrate which is heated to the same temperature, it is the examiner's position that one of ordinary skill when looking in the prior art to obtain a suitable technique with parameters that would obtain the above smoothness and crystallization properties, they would find the method with the parameters taught by Wasa et al. to be obvious to produce desired results. Therefore, it is the examiner's position that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Anzaki et al. to include that the physical and optical properties of the layers can be optimized by optimizing the production parameters of the layers, including the zinc oxide layer, with any suitable parameters such as the ones taught by Wasa et al., in order to obtain desired physical and optical properties of the overall filter.

<u>Consider the layer being sputtered in the presence of an ion beam from an ion source.</u>

As it was discussed, that crystallization and smoothness of the layers would be desired by one with ordinary skill in the art, it is also the examiner's position that one with ordinary skill in the art would recognize that although the modified parameters of Wasa et al. produces enhanced smoothness, due to the layer being crystallized, it would be recognized that slight roughness in the surface may still occur as it may be difficult to produce a flaw free surface by just optimizing the sputtering parameters. Therefore, it is the examiner's position that if one desired to improve surface smoothness further for the same reason as presented above, they would look to the prior art to find a suitable technique that might produce the smoothness desired results

for the layers including specifically a method of obtaining smoothness of dielectric layers such as the zinc oxide layers above.

In particular, Fenner teaches a method of processing a work piece surface such as dielectric surfaces (0002). Fenner teaches that after deposition and crystallization of dielectric materials and metal materials, the method is meant to enhance said material surface (0002). Fenner teaches that the method comprises exposing the surface to an ion beam from an ion beam source and by performing this step, the smoothness of the surface can be adjusted by varying the ion source parameters such as voltages, etc. (0013-0036). Further, Fenner teaches that due to articles comprising said materials occurring as multiple layers on a substrate or having interacting/interconnecting subcomponents, the above method is preferred because high figure of merit for the surfaces is required (0002-0007).

As Anzaki et al. as modified and Fenner both disclose a desired for surface smoothness, including smoothness of dielectric layers, as it will affect the physical properties of the structure, it is the examiner's position that it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Anzaki et al. to include that if additional smoothness was desired for the dielectric layers, then the method of Fenner could be used on the dielectric layers in order to obtain desired overall physical results of the filter.

Further, while Anzaki et al. now included that the layers which are crystallized can be exposed to an ion beam "after" deposition and crystallization, they are still silent regarding using the ion beam method "during" the sputtering deposition step. It is the

examiner's position that while, as discussed, one would see it as advantageous to expose an ion beam source after the deposition method is performed to rid the final surface of any roughness, one of ordinary skill in the art would recognize that if the materials are deposited and crystallized during sputtering, then roughness will continually occur during the deposition process and if one desired to limit the amount of roughness in the final surface and thereby create less etching in the final product, then they would find it obvious to try to subject the layer to an ion source during the sputtering step as it would continually reduce roughness as the layer is formed. As such, it is the examiner's position that it would have been obvious to one of ordinary skill in the art at the time of invention to try to subject the layers to the ion beam source of Fenner during sputtering in order to reduce the roughness of the surface **(Claim 1**).

Claims 2-3: While the substrate of Anzaki et al. now includes all the limitations of claim 1, the reference is still *silent regarding the layer having a very low roughness, which the applicants' define on page 3, lines 25-30 of their specification to be a roughness of at least 20% or more preferably 50% or less than that of the same layer not exposed to an ion source and the examiner notes that this limitation of "At least 20%" is the same limitation of claim 3.*

While Anzaki et al. as modified does not include the above limitation, it was discussed above that the ion source was meant to smooth out the surface of the layer and that the smoothness can be changes by adjusting the parameters of the ion source. Further, as evidenced by Fenner, the ion beam method which now is present in Anzaki

et al, is capable of producing surface roughness of at least 20% and even 50% less than a surface that was not yet exposed (Fenner 0043).

From this, it is the examiner's position that one of ordinary skill in the art would recognize that depending on the amount of roughness/smoothness one desired to have on the surface, they would know that the parameters of the ion source could be adjusted to alter the physical properties of the surface. Therefore, through routine experimentation, one can obtain desired roughness/smoothness surface results. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Anzaki et al., to include that the roughness of the at least one dielectric layer surface can be modified through the adjusting of the ion source parameters to produce any desired amount of roughness such as the amounts claimed by the applicants' in claims 2 and 3 compared to that of a layer not exposed to an ion source **(Claims 2-3)**.

Claims 4-6 and 8: Anzaki et al. also teach that the dielectric layer can be comprised of a metal oxide such as zinc oxide (0031) **(Claims 4-5)** and that the dielectric layer can have a refractive index of between 1.6 and 2.7 (0019) **(Claim 6)**. Further, the reference does not disclose that any iron is present in the layers and therefore, this corresponds to the applicants' "less than 3 %" **(Claim 8)**.

Claim 7: While Anzaki et al. discloses the above teaching as well as the dielectric layer being zinc oxide, they *do not specifically disclose the limitation of the layer having a crystallinity of at least 90.*

Although the above limitations are not discussed in the reference, the examiner notes that as discussed, the layers being crystallized affect the optical properties of the layer since the crystalline orientation will affect the manner in which light is reflected. The examiner also notes that the crystallinity of the article (the amount of crystallinity) is a result effective variable as it is known that by adjusting the amount of crystallinity, the more oriented crystals will be present and therefore, the more surfaces light will be reflected on will occur. Therefore, if one desired to have increased directed reflection as discussed, then one of ordinary skill would recognize that if the crystallinity is increased then so will the amount of directed reflectance. Also, as evidenced by Wasa et al., the growth rate represents the amount of crystals that are grown in the layer which is known in the art to affect the overall crystallinity of the final layer and as illustrated in the table, this degree of crystallinity occurs due to the processing parameters.

Therefore, if one desired to increase the amount of reflection , they would recognize that the crystal growth could be adjusted thereby adjusting the amount of crystallinity within the final product, the parameters of Rf power, etc. could be adjusted to any values, while remaining within the limitations as set forth by Anzaki, in order to produce the desired results and through routine experimentation desired optical properties can be obtained. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Anzaki et al. to include that the magnetron sputtering parameters could be adjusted to any value in order to optimize the crystal growth rate which will in turn affect the final crystallinity of the layer and in turn obtain the desired amount of directed light reflectance within the layer **(Claim 7)**.

Consider claim 9: While Anzaki et al. discloses the above teaching as well as the dielectric layer being zinc oxide, they *do not specifically disclose the limitation of the layer having an argon content of around 0.2 to 0.6 at%.*

However, the examiner notes that as modified the reference of Anzaki et al. disclose the use of sputtering in the presence of argon and oxygen (0102-0104) and using an ion source which Fenner taught is made with a gas source comprised of a mixture of argon and oxygen (0044). The examiner notes that although the reference does not specifically disclose that argon is within the layer, one of ordinary skill in the art would recognize that layers being subjected to ions bombardment, which is known to occur with the above processes, will at least have trace amounts of each gas ion present in some form therein. Also, since the applicants' claim includes "around 0.2%", the examiner notes that this percentage allows for values slightly above and below the claimed value which will include from 0% to trace amounts slightly below 0.2 **(Claim 9)**.

Claims 11-14: Anzaki et al. also teach that a silver layer can be disposed on top of the dielectric layer (abstract), which as discussed, the dielectric layer is exposed to the ion beam **(Claim 11).** They further teach that there may be more than one dielectric layer that can be alternately laminated with silver layers on the substrate wherein there may be at least two silver layers within the multilayered structure (abstract, 0049 Figures) **(Claims 12-13)**. Anzaki et al. also teach that the substrate can have a sheet resistant of 1.9Ω/□ (0137) **(Claim 14)**.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being obvious over Anzaki et al. (US Pub. No. 2002/0086164) Wasa et al. and Fenner as applied to claims 1 and 5 above in view of Anzaki et al. (US PN. 6,316,110).

As discussed, Anzaki et al. (US Pub) was modified to include all the limitations of claims 1 and 5 and as discussed, zinc oxide can be used as the dielectric layer and that it is inherent that the dielectric layer crystallizes. However, Anzaki et al. (US Pub) is *silent regarding the use of the substrate with the multilayered silver and dielectric layers coated thereon being used in a double or laminated glazing assembly*.

While Anzaki et al. (US Pub) does not specifically disclose this teaching, they do teach that the substrate comprising the alternating multilayered structure of the silver and dielectric layers is used as an electromagnetic wave filter and that the device should have high visible transmission and low infrared transmission (abstract).

Anzaki et al. (US PN) teach an electromagnetic wave filter for a plasma display panel comprising a substrate and a multilayered structure comprising alternating layers of silver and dielectrics (abstract, Figures). They teach that it has been known in the art to use substrates with alternating layers of silver and dielectrics in windows, electronic devices and/or double and/or laminated glazing window units and that structure such as these shield infrared radiation while produce high visible transmission (Col. 1, lines 20-60).

Anzaki et al. (US Pub) and Anzaki et al. (US PN) disclose analogous art related to light transmitting electromagnetic wave filters comprising alternating layers of dielectrics and silver layers. From the teaching in Anzaki et al. (US PN) that it is known

in the art that structures such as the one taught in Anzaki et al. (US Pub) have been used in double glazing window units and that units such as these shield IR but allow visible transmission, it is the examiner's position that one would recognize and find it obvious to try and use the structure of Anzaki et al. (US Pub) in a double glazing unit as it would produce advantageous infrared shielding while permitting light. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to try and modify Anzaki et al. (US Pub) to include that the structure could be used in a double glazing unit to provide for infrared shielding and light transmission **(Claim 15)**.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAUREN ROBINSON whose telephone number is (571)270-3474. The examiner can normally be reached on Monday to Thursday 6am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-2721284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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